pointment of a deputy judge seems inconsistent with the principle of the Bill, as every one would be desirous of obtaining the highest legal authority which the Act affords, and would be discontented with a secondary jurisdiction. The single "architectural referee" standing at the elbow of the judge and indoctrinating him with his own peculiar professional opinions is not a picture which will please many litigants. The proposal that such architectural referee shall alone have the supervision of all public buildings, and that consequently architects even of the highest standing will be legally compelled to submit to his *dicta* on all points of construction, instead of having, as at present, the opinion of three professional gentlemen, is almost an insult to the profession at large.

Lord Carlisle's Bill, retaining the three referees, has several points of superiority to the proposed enactment. The judge in the latter Act has certainly the power of sending a case to arbitration by consent of the parties, which is no more than they could do themselves without the Act. Lord Carlisle's Act provided the court of reference ready formed for the purpose.

By Lord Seymour's Bill a jury of five persons may be summoned to try cases of rights and easements, cases, of all others, the most unfit for jurymen (who would probably be shopkeepers) to decide. Here, again, the fixed court of reference would be more appropriate, and would be able in a short time to collect and adjudicate on such a number of cases as would be a means of definitely fixing the right and laws of the subject,—a point which can never be obtained from jury verdicts without the revision of a superior court.

In the proposed Bill there is a right of appeal on all matters of law to one of the superior courts on a case drawn by the judge himself. Such appeal is strictly necessary, but the right should be extended to other cases even at the risk of increased litigation.

The alterations in the schedules require the careful examination of the district surveyors, upon whom the responsibility devolves of executing them in a satisfactory and complete manner; and it is to be hoped that they will enforce the principle of non-interference with private rights, and endeavour to confine the regulations to the real objects of the bill, for preventing fire, maintaining party-walls, and enforcing obvious sanitary measures in the construction of houses. T. L.

THE GEOMETRIC PROPORTIONS OF ANCIENT ARCHITECTURE.*

If we consider what are the conditions necessary to be fulfilled in every case in which beauty is aimed at in a building in order to produce that half sensuous, half intellectual gratification which in modern language is expressed by the term æsthetic enjoyment, we find that three principal conditions are essential. The first of these is stability or balance inclining to the safe side; but a perfectly well built and perpendicular wall may fully satisfy this requisite in so far, and yet have no claim whatever to beauty, merely because it is *safe*.

The second, therefore, is, that the first condition, viz., security, should be combined with indications of insecurity met by sufficient support, so that the imagination and intellect should be at once aroused to the consideration of this contention of forces. Of this nature are projecting mouldings, cornices, &c.

The third is, that in relation to, and subservient to the two first conditions, ornament suggestive of other ideas, connected with the intention of the building in question, should be added, in order that it may directly address itself to the intellect and imagination in other respects.

It will be evident that the last condition here entirely depends upon the previous fulfilment of the two former, for where the general proportions, as well as those of the individual parts that indicate construction or points of balance, are unknown, the superfluities cannot be rendered perfectly congruous with the whole. For its accomplishment, therefore, the highest genius is required, and in its failure the greatest amount of ignorance is displayed.

If it be true that ornamentation must be as subservient to the two first conditions as it was studiously rendered by the Greeks, then a perfect knowledge of the balance of forces in as far as the entire building is concerned, will be required in the first instance, and a truly artistic and poetical conception of congruity and intention in the second.

It is this combination of mechanical knowledge, and artistic feeling and education, that has rendered the highest class of architectural design so very rare in the world's history.

The discovery of the works of Vitruvius, at a period which otherwise might have given rise to a new and grand style of architecture, supplied a set of arbitrary rules which have for centuries proved a complete barrier to the investigation of fundamental principles. There exists in most minds a much stronger tendency to take for granted what they hear boldly stated than to think for themselves: rules are more easily received than principles, and well asserted quackery ever finds more and more strenuous believers than the most elaborately proved truth. So it is with the pure empiricism of Vitruvius; and his method of dividing the lower diameter of the shaft into sixty degrees, by which to measure every other proportion, is still universally followed. This could not have been the case had he possessed even the slightest acquaintance with the methods pursued by the architects of the buildings he describes, and which all admire; for he would then have known not only that this is the very worst, because least certain, proportion of the order he could have selected for his metre, but he would also have been aware that no metrical method could possibly represent the various proportions found in the different styles by numbers. This authority is now, however, on the wane, since it has been discovered that the best Grecian models do not correspond with his rules. Several very ingenious attempts have lately been made to discover general laws of proportion to supply this want; but while it enhances our admiration of the skill of the ancients to find that their works correspond with laws of which those who designed them were ignorant, all these theories have this defect in common, that, although they prove the correctness of the proportions adopted, they could not have originated the forms. What we have to look for is a *method of construction* at once simple and practical, which, though founded on mathematical principles, may yet be sufficiently intelligible to those ignorant of mathematics to enable them to use it.

The want of such a system has resulted in the general adoption of a mode of teaching architecture most perfectly calculated to discourage originality of thought, and to bend the mind of the pupil down to a slavish submission to merely asserted authority; whereas, if taught in a right spirit, all the elements of this art being the purely mechanical forces, it ought, of all others, to produce the most directly practical thinkers. The pupil was taught to copy capitals and bases of columns detached from their shafts, and to retain these and their measurements as invariable rules, without, perhaps, ever being shown an example of the order drawn in its complete proportions,—so that, it was impossible he could even conceive their proportions in reference to the entire building.

He learned rules, but of principles he necessarily remained utterly and entirely ignorant.

Educated as an anatomist, in the full belief that if we have but the capacity to understand them, and the patience to investigate the works of the Creator, we shall find no less to admire in the wonderful adaptation of the different organs to one another, and as parts of the entire frame, than in that of the excellence of their individual structures; and, considering the architectural monuments of Greece among the highest attainments of human genius, which, in so far as they went, were perhaps the nearest approach in perfection to the works of the great architect of the universe, I felt inclined to investigate them in nearly the same spirit of humility with which the physiologist would proceed to study a part of the animal frame with the uses of which he was unacquainted: to assume them as perfect, and to deem no part useless, superfluous, or unmeaning, and no proportion adopted without a reason.

Conducted on these principles the investigation has resulted, as I trusted it would, in the discovery of a system as remarkable for its simplicity as for the universality of its application.

Architecture in Greece is evidently an imported science, as there exists no evidence of any intermediate step from the rudest to the most perfect works, such as may be found in the more primitive countries — Assyria and Egypt,—and to show whence it was derived and how its principles originated it is necessary to examine the mode of building prevalent in these countries. Their climates were arid and timber scarce: the walls were formed as they are there at the present day, of dried mud: the roof, also of dried mud, rested on horizontal rafters: the walls were made as high as the timbers of the roof were long, and the mud roof being thick and heavy, required support. In the façade of an Egyptian temple, the natural arrangement of scaffolding to support the roof that formed a square with the walls, would suggest not only the proportions, but even the fanciful ornamentation of the columns by which the scaffolding was to be replaced. This square space might be divided by upright posts into two, or three, or four rectangles, each calculated to receive a column; but three was the usual number in Egypt, and the attention of freemasons is directed to the remarkable manner in which the methods to be pointed out correspond with the traditionary symbols of masonry,—such as the three steps of masonry, Jacob's ladder, the tesselated pavement, &c. &c.:—all this, the lecturer considered, went far to prove that though their meaning had been lost for full 2,000 years, the symbols and traditions had been wonderfully correctly handed down from perhaps a much more remote period, and directly from Egypt. The square formed between the flat roof and the walls early became a rule in masonry, which was never afterwards greatly deviated from. The architecture of Greece differed from that of Egypt in form, but not in principle, showing that the Egyptian order of priesthood, that represented by our architects and civil engineers, taught principles as well as practice, and that their Grecian disciples, though bound down by all the mysterious vows of secrecy still to be found among freemasons, were able to emancipate themselves from the thraldom of rule that oppressed everything in Egypt, and to devise new applications suited to a climate in which it was necessary to guard against rain as well as heat. They introduced the sloping roof and the frieze for this purpose, and thus gained additional space for the introduction of appropriate ornament.

Now with regard to the construction of the Parthenon, deemed one of the most perfect of the Greek temples: finding that its façade, including the pediment, occupies a square of nearly two squares set side by side, let us work in one of these squares by dividing it equally into four parts horizontally, and then again perpendicularly in like manner into four: it is thus chequered or tesselated into sixteen small squares, which, regarded perpendicularly, resolve themselves into four tiers, each composed of four squares:—take away the topmost row of small squares from the roof and cornice, and there remain four tiers, each composed of three squares high. These severally indicate spaces in which to erect a column with its entablature. Now, let us dismiss this chequered square from present consideration and confine our attention to one of those spaces containing three small squares, upon which its own portion of the roof will rest. It will be shown that a few leading proportions of the order may readily be found within this space, and as it would be impossible to demonstrate more in this cursory manner without fatiguing the audience, I will ask you to believe me when I

* The following is a part of a lecture delivered at the School of Design, Manchester, by Dr. Charles Bell, one of the members of the Council of the School.

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